

WHAT IS CLAIMED IS:

1. A mixture of isomers of dodecanethiol prepared by a process for the catalytic reaction of hydrogen sulfide with the trimer of n-butene and exhibiting a diagram of distillation temperatures, at 19 millibar, such that point 50 is $123^{\circ}\text{C} \pm 1^{\circ}\text{C}$ and that the difference in temperature between point 20 and point 80 is less than or equal to 4°C .
2. The mixture as claimed in claim 1, characterized in that the catalyst is chosen from an acid compound, a metal oxide or a combination of these 2 products.
3. The mixture as claimed in either of claims 1 and 2, characterized in that the catalyst is a cation-exchange resin.
4. The mixture as claimed in one of claims 1 to 3, characterized in that the catalyst is a copolymer of sulfonated styrene with divinylbenzene.
5. The mixture as claimed in one of claims 1 to 4, characterized in that the molar ratio of the hydrogen sulfide to the olefin is between 1 and 100, preferably between 1 and 20.
6. The mixture as claimed in claim 5, characterized in that the molar ratio of the hydrogen sulfide to the olefin is between 1 and 5.
7. The mixture as claimed in one of claims 1 to 6, characterized in that the process is carried out at a temperature of between 10 and 250°C and at a pressure of between 5 and 80 bar.
8. The mixture as claimed in claim 7, characterized in that the process is carried out at a

temperature of between 50 and 150°C and at a pressure of between 10 and 50 bar.

- 5 9. The mixture as claimed in claim 8, characterized in that the process is carried out at a temperature of between 70 and 120°C and at a pressure of between 10 and 20 bar.
- 10 10. A process for the preparation of the mixtures of claims 1 to 9, characterized in that it comprises the reaction of hydrogen sulfide with tri(n-butene) in the presence of an acid catalyst.
- 15 11. A process for radical (co)polymerization, characterized in that it is carried out in the presence of the mixture as claimed in one of claims 1 to 9 used as chain-transfer agent.
- 20 12. A process for the synthesis of di(tert-dodecyl) polysulfides, characterized in that it is carried out by reaction of the mixture as claimed in one of claims 1 to 9 with sulfur in the presence of a basic catalyst.